N° 2241 A.D. 1889

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PROVISIONAL SPECIFICATION.

Improvements in Syringes.

I, Dr. Martin Overlach, of Frankfort-on-the-Main in the Empire of Germany Physician do hereby declare the nature of this invention to be as follows :—

This invention relates to injection and other syringes and comprises improved means for making a tight joint on the one hand between the syringe cylinder and the injection nozzle at the front end of the same, and on the other hand between the said cylinder and the part by which the rear end of the latter is closed and which forms a guide for the piston-rod.

Owing to the great difficulty in the wholesale manufacture of syringes, of making the glass cylinders of exactly equal diameters and lengths and forming straight edges at right angles to the sides of the same, the means heretofore used for forming the joints between the cylinder fittings and the body of the syringe have the following serious defects.

The putty or cement for securing the fittings or ends to the glass cylinder will last only a short time by reason of its contact with the liquids used, and will moreover prevent the syringe from being completely dismounted for cleaning purposes.

The cutting of a screw thread upon the ends of the glass cylinder renders the latter very liable to break and the substitution of a broken cylinder by another becomes very difficult or impossible if there is the slightest inequality in the glass cylinder. The joint at the nozzle end which is mostly made by means of an impregnated leather washer or disc usually commences to leak very quickly.

The body of the syringe cannot be hermetically closed by clamping the same between two end caps or plates connected by metal rods and caused to approach each other by means of nuts unless the edges or end surfaces of the glass cylinder are quite straight and at right angles to the sides of the same. This requires accurate work which is not usually carried on in the wholesale manufacture of syringes.

The syringe constructed according to my invention is designed to obviate the aforesaid defects which are extremely serious considering the importance of a reliable and absolutely clean instrument.

By its improved arrangement it enables putty or other binding material to be dispensed with and the end surfaces of the cylinder do not require to be formed straight and at right angles to the sides of the cylinder. It permits the use of glass tubes having absolutely flat walls and no threads and obviates the necessity for accurate equality in the inside width of the cylinder and in the thickness of the wall of the latter. Furthermore it enables all the parts to be kept thoroughly clean because they are all exposed to view, and advantageously differs from the syringes hitherto employed by its great simplicity.

A socket arranged at the rear end of the syringe cylinder serves as a guide for the piston rod. This socket has at its end extending into the said cylinder a disc and is provided with a screw thread over which a packing ring and a disc are slid, and with which engages a cap provided with a female thread. By screwing this cap more or less tightly against the aforesaid disc the packing ring between the latter and the disc formed on the socket is more or less powerfully compressed. In consequence of this compression the circumference of the packing ring becomes larger and is pressed more or less firmly against the inner wall of the cylinder, thereby producing a more reliable and tight joint between the guide for the piston rod and the body of the syringe. In order to further increase the tightness of this joint the inner wall of the glass cylinder, where it comes in contact with the packing ring is provided with a groove into which the circumference of the packing ring

[*Price 8d.*]

is forced as the latter is compressed. When screwing the cap upon the socket the smooth glass cylinder is liable to turn in the hand. In order to obviate this inconvenience the said socket is flattened and the disc which is adapted to slide upon the same is provided with a bore corresponding in transverse section to the shape of the socket. By this means the said disc which must be firmly held when screwing the caps upon the socket is prevented from being carried away with the latter so that the glass cylinder will not turn in the hand.

The joint at the front end of the syringe cylinder between the latter and the nozzle is formed in a similar manner as that between rear end of the aforesaid cylinder and the guide for the piston rod. The nozzle comprises a discharged tube provided at its end which is inserted into the syringe cylinder with a disc. A screw thread is formed upon the discharge tube over which an elastic packing ring and a collar are slid, both these latter part being of a somewhat smaller diameter than the inside width of the glass cylinder. With the screw thread upon the tubes engages a female thread provided in a disc which is firmly screwed against the above mentioned collar so as to compress the packing ring placed between the latter and the end disc formed upon the end of the discharge tube. According as the packing ring is compressed more or less by these means the nozzle is connected more or less firmly with the syringe cylinder.

For cleaning the syringe all the parts of the latter can be easily separated or dismounted by simply slackening the aforesaid cap and disc and then removing the fittings from the extremities of the cylinder.

Dated this 7th day of February 1889.

HASELTINE, LAKE & Co.,
45, Southampton Buildings, London, W.C., Agents for the Applicant.

COMPLETE SPECIFICATION.

Improvements in Syringes.

I, Martin Overlach, of Frankfort, on-the-Main, in the Empire of Germany, Physician, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to injection and other syringes and comprises improved means for making a tight joint on the one hand between the syringe cylinder and the injection nozzle at the front end of the same, and on the other hand between the said cylinder and the part by which the rear end of the latter is closed and which forms a guide for the piston rod.

Owing to the great difficulty, in the wholesale manufacture of syringes, of making the glass cylinders of exactly equal diameters and lengths and forming straight edges at right angles to the sides of the same the means heretofore used for forming the joints between the cylinder fittings and the body of the syringe have the following serious defects.

The putty or cement for securing the fittings or ends to the glass cylinder will last only a short time by reason of its contact with the liquids used and will moreover prevent the syringe from being completely dismounted for cleaning purposes.

The cutting of a screw thread upon the ends of the glass cylinder renders the latter very liable to break and the substitution of a broken cylinder by another becomes very difficult or impossible if there is the slightest inequality in the glass cylinder. The joint at the nozzle end, which is mostly made by means of an impregnated leather washer or disc usually commences to leak very quickly.

The body of the syringe cannot be hermetically closed by clamping the same between two end caps or plates connected by metal rods and caused to approach each other by means of nuts, unless the edges or end surfaces of the glass cylinder are quite straight and at right angles to the sides of the same. This requires accurate work which is not usually carried on in the wholesale manufacture of syringes, The syringe constructed according to my invention is designed to obviate the aforesaid defects which are very serious considering the importance of a reliable and absolutely clean instrument.

By the improved arrangement putty or other binding material may be dispensed with, and the end surfaces of the cylinder do not require to be formed straight and at right angles to the sides of the cylinder. It permits the use of glass tubes having absolutely flat walls and no threads, and obviates the necessity for accurate equality in the inside width of the cylinder and in the thickness of the wall of the latter. Furthermore, it enables all the parts to be kept thoroughly clean because they are all exposed to view and it has the advantage over the syringes hitherto employed, that it is exceedingly simple.

In the accompanying drawings,

Figure 1 is a longitudinal section of the improved syringe, and

Figure 2 is a transverse section of the same on the line I I of Figure 1.

A socket *f* arranged at the rear end of the syringe cylinder serves as a guide for the piston rod. This socket has at its end extending into the said cylinder a disc *e*, and is provided with a screw thread *g* over which a packing ring *d* and a disc *r* are slid, and with which engages a cap *k* provided with a female thread. By screwing this cap more or less tightly against the aforesaid disc *r* the packing ring *d* between the latter and the disc *e* formed on the socket is more or less powerfully compressed. In consequence of this compression the circumference of the packing ring becomes larger and is pressed more or less firmly against the inner wall of the cylinder, thereby producing a more reliable and at the same time tighter joint between the guide *f* for the piston rod and the body of the syringe. In order to further increase the tightness of this joint the inner wall of the glass cylinder, where it comes in contact with the packing ring, is provided with a groove into which the circumference of the packing ring is forced as the latter is compressed. When screwing the cap *k* upon the socket the smooth glass cylinder is liable to turn in the hand. In order to obviate this inconvenience the said socket *f* is flattened as shown in Figure 2 and the disc *r* which is adapted to slide upon the same is provided with a bore corresponding in transverse section to the shape of the socket. By this means said disc *r* which must be firmly held when screwing the caps *k* upon the socket is prevented from being carried away with the latter, so that the glass cylinder will not turn in the hand.

The joint at the front end of the syringe cylinder between the latter and the nozzle is formed in a similar manner as that between rear end of the aforesaid cylinder and the guide for the piston rod. The nozzle comprises a discharge tube f^1 provided at its end which is inserted into the syringe cylinder with a disc e^1. A screw thread g^1 is formed upon the discharge tube, over which an elastic packing ring d^1 and a collar r^1 are slid, both these latter parts being of a somewhat smaller diameter than the inside width of the glass cylinder. With the screw thread g^1 upon the tube engages a female thread provided in a disc k^1 which is firmly screwed against the abovementioned collar r^1 so as to compress the packing ring d^1 placed between the latter and the end disc *e* formed upon the end of the discharge tube.

According as the packing ring is compressed more or less by these means the nozzle is connected more or less firmly with the syringe cylinder.

For cleaning the syringe all the parts of the latter can be easily separated or dismounted by simply slackening the aforesaid cap *k* and disc k^1 and then removing the fittings from the extremities of the cylinder.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is :—

First. In injection and other syringes the arrangement of the piston-rod guide socket *f* with the terminal disc *e* arranged within the syringe cylinder, and the screw thread *g* upon which is arranged the cap *k* with a suitable female thread whilst between the cap and the fixed terminal disc e is arranged a ring r adapted to be easily displaced upon the screw-thread, and the packing ring d, so that when the cap k is screwed with more or less power against the ring r by reason of the greater or smaller compression of the ring d by which the latter is pressed against the inner periphery and into the groove formed in the glass cylinder—the piston-rod guide socket f is connected more firmly or more loosely with the syringe cylinder.

Second. The arrangement of the discharge tube f^1 serving for the injecting nozzle with the terminal disc e^1 placed within the syringe cylinder, and with the screw thread q^1, upon which the disc k^1 provided with a suitable female thread is placed, whilst between the said disc and the fixed terminal disc e^1 are placed the ring r^1 adapted to be easily displaced upon the screw thread and the packing-ring d^1, so that when the disc k^1 is screwed more or less powerfully against the ring r^1 by reason of the greater or smaller compression of the ring d^1—by which the latter is pressed against the inner periphery and into the groove formed in the glass cylinder—the discharge pipe f^1 is connected more firmly or more loosely with the syringe-cylinder.

Dated this 26th day of October 1889.

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OVERLACH'S Complete Specification.

(1 SHEET)

Fig. 1.

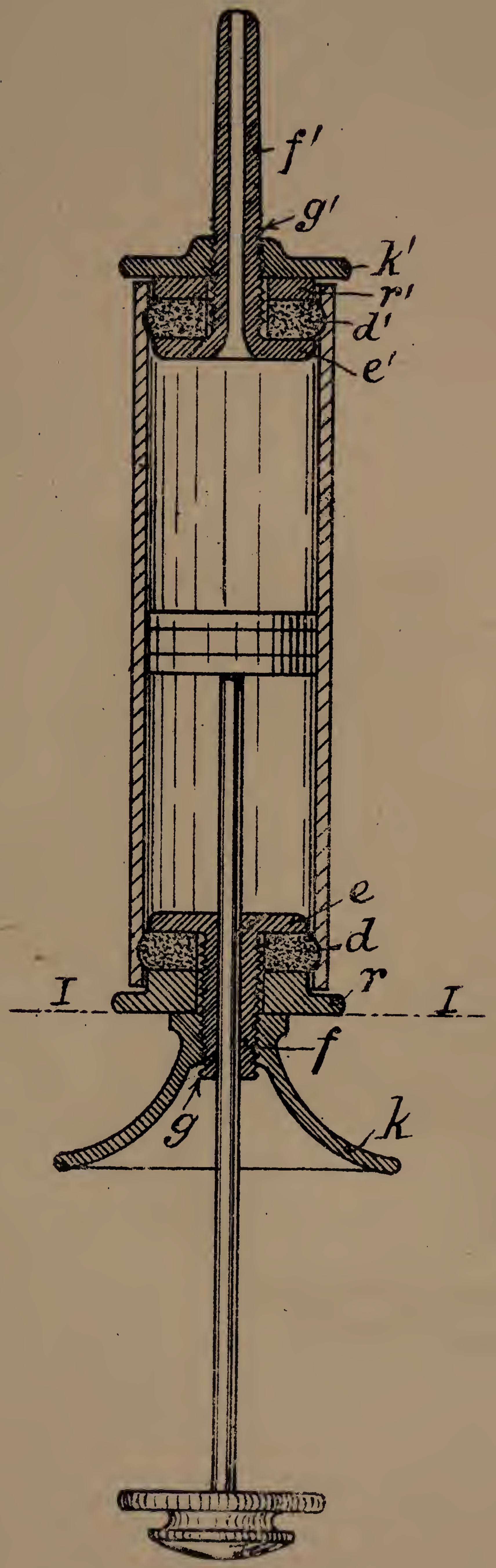
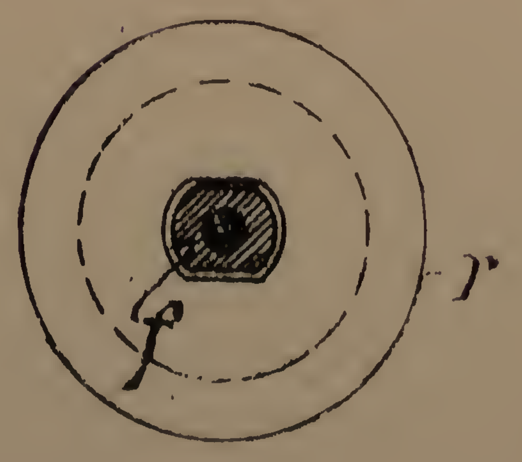


Fig. 2.



[This Drawing is a full-size reproduction of the Original.]

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